

# COMPARATIVE BIOCHEMISTRY AND PHYSIOLOGY

*An International Journal*

EDITOR: G. A. KERKUT (*Southampton*)

## List of Contents and Author Index

Volume 101 Part A, 1992



**PERGAMON PRESS**

OXFORD · NEW YORK  
SEOUL · TOKYO

# Comparative Biochemistry and Physiology

## *Executive Editor*

Professor G. A. KERKUT, Department of Physiology and Biochemistry, University of Southampton, Southampton SO9 3TU, U.K. Tel.: (0703) 594341; Fax: (0703) 594319

## *Assistant Editor*

Dr R. G. WILLIAMS, Department of Physiology and Biochemistry, University of Southampton, Southampton SO9 3TU, U.K. Tel.: (0703) 594341; Fax: (0703) 594319

## *Members of the Honorary Editorial Advisory Board*

H. L. ATWOOD (Toronto)	D. NASSEL (Stockholm)
H. BRETTING (Hamburg)	Y. PICHON (Rennes)
T. BRITTAIN (Auckland)	T. PIEK (Amsterdam)
E. FLOREY (Konstanz)	H-O. PÖRTNER (Dusseldorf)
M. J. GARSON (Queensland)	E. SKADHAUGE (Frederiksberg)
M. J. GREENBERG (St Augustine)	H. TAKEUCHI (Gifu)
T. T. HERSKOVITS (New York)	E. W. TAYLOR (Birmingham)
H. HUDDART (Lancaster)	P. VANNI (Florence)
L. G. MAGAZANIK (Leningrad)	D. A. YORK (Baton Rouge)
C. P. MANGUM (Williamsburg)	P. F. ZAGALSKY (London)
T. A. MCKEAN (Idaho)	

*Publishing, Subscription and Advertising Offices:* Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, U.K. Tel.: (0865) 794141; Fax: (0865) 60285.

*North America:* Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

### *Annual Subscription Rates 1992 (including postage and insurance)*

Annual institutional subscription rate (1992): Part A, Comparative Physiology £1020.00 (US\$1850.00); Part B, Comparative Biochemistry £1025.00 (US\$1860.00); Part C, Comparative Pharmacology and Toxicology £720.00 (US\$1305.00); combined subscription, £2560.00 (US\$4645.00). 2 year institutional rate (1992/93): Part A, £1938.00 (US\$3515.00); Part B, £1947.50 (US\$3534.00); Part C, £1368.00 (US\$2479.50); combined subscription, £4864.00 (US\$8825.50). Sterling prices are definitive. US dollar prices are quoted for convenience only, and are subject to exchange rate fluctuation. Prices include postage and insurance and are subject to change without notice. Subscription rates for Japan are available on request.

Personal subscription rate for those whose library subscribes at the regular rate is available on request. Parts A and B, published monthly, three volumes of each part per year, four issues per volume. Part C, published monthly except in March, August and December, three volumes per year, three issues per volume.

Second class postage paid at RAHWAY, NJ. Postmaster send address corrections to Pergamon Press Inc., 660 White Plains Road, Tarrytown, NY 10591-5153, U.S.A.

Whilst every effort is made by the publishers and editorial board to see that no inaccurate or misleading data, opinion or statement appears in this journal, they wish to make it clear that the data and opinions appearing in the articles and advertisements herein are the sole responsibility of the contributor or advertiser concerned. Accordingly, the publishers, the editorial board and editors and their respective employees, officers and agents accept no responsibility or liability whatsoever for the consequences of any such inaccurate or misleading data, opinion or statement.

# CONTENTS OF VOLUME 101

Vol. 101A, No. 1

## Mini Reviews

James R. Jauchem and Melvin R. Frei

- 1 Heart rate and blood pressure changes during radiofrequency irradiation and environmental heating

Inna I. Kruman

- 11 Comparative analysis of cell replacement in hibernators

## General Papers

Y. Hertz, Y. Shechter, Z. Madar and A. Gertler

- 19 Oral absorption of biologically active insulin in common carp (*Cyprinus carpio* L.)

Peter J. Rombough

- 23 Intravascular oxygen tensions in cutaneously respiring rainbow trout (*Oncorhynchus mykiss*) larvae

Ryozo Fujii, Masazumi Sugimoto and Noriko Oshima

- 29 Blanching at night of denervated bands in teleostean tail fins is due to pigment aggregation in melanophores by melatonin

G. Gargiulo, G. Andreozzi, R. Antonucci, N. Arcamone, P. de Girolamo and P. Battaglini

- 33 Behavioural and histochemical changes induced by osmotic stress in *Poecilia reticulata* Peters (Pisces, Cyprinodontidae)

Christopher B. Daniels and Jonathan Pratt

- 43 Breathing in long necked dinosaurs; did the sauropods have bird lungs?

Alex D. Hoffman, Sharon L. Bertelsen and Michael L. Gargas

- 47 An *in vitro* gas equilibration method for determination of chemical partition coefficients in fish

Yong Keun Kim, Jin Sup Jung and Sang Ho Lee

- 53 Uptake of uric acid and *p*-aminohippurate (PAH) by renal cortical slices of various mammals

Derek Litthauer and Ginette Serrero

- 59 The primary culture of mouse adipocyte precursor cells in defined medium

Masataka Yoshino, Chikashi Yamamoto, Keiko Murakami, Yoshinao Katsumata and Shigeo Mori

- 65 Stabilization of the adenylate energy charge in erythrocytes of rats and humans at high altitude hypoxia

James J. Nagler and David R. Idler

- 69 *In vitro* ovarian estradiol-17 $\beta$  and testosterone responses to pituitary extract and corresponding serum levels during the pre spawning to vitellogenic phases of the reproductive cycle in winter flounder (*Pseudopleuronectes americanus*)

S. C. Chakraborty, L. G. Ross and B. Ross

- 77 The effect of photoperiod on the resting metabolism of carp (*Cyprinus carpio*)

M. Salzert, M. Verger-Bocquet, C. Watzet and J. Malecha

- 83 Evidence for angiotensin-like molecules in the central nervous system of the leech *Theromyzon tessulatum* (O.F.M.). A possible diuretic effect

P. R. Laming, I. V. Ocherashvili and A. U. Nicol

- 91 Dendritic and sustained shifts in potential to electrical stimulation of the anuran tectal surface

Yuzo Ninomiya, Shuji Kurenuma, Takayuki Nomura, Hajimu Uebayashi and Hirosada Kawamura

- 97 Taste synergism between monosodium glutamate and 5'-ribonucleotide in mice

H. Tazawa, S. Yamaguchi, M. Yamada and K. Doi

- 103 Embryonic heart rate of the domestic fowl (*Gallus domesticus*) in a quasiequilibrium state of altered ambient temperatures

A. Stucchi-Zucchi and L. C. Salomão

J. Hattingh and D. Petty

J. V. Clark

Comparative Nutrition Papers

Françoise Goudey-Perrière,  
Patrick Porcheron,  
Madeleine Morinière, Claude Perrière  
and Paulette Brousse-Gaury

Vasiliki Argyropoulou,  
Nick Kalogeropoulos and  
Maria N. Alexis

M. A. Mitchell and A. J. Carlisle

Dorothy W. Gietzen, Adam S. Harris,  
Scott Carlson and Alan Gelperin

A. T. Brice

C. Barker Jørgensen

I. Tarvid

Mitsuhiro Furuse, Ryusuke Okada,  
Kazumi Kita, Koshi Asakura and  
Jun-ichi Okumura

Marilyn C. Erickson

Ruo-Jun Xu and P. D. Cranwell

Mini Reviews

D. B. Shennan

A. O. Elkhawad

General Papers

V. S. Elbrønd and E. Skadhauge

Kiyonori Yoshii, Masauki Takakuri  
and Kenzo Kurihara

M. G. MacLeod, A. Watson and  
T. Sonoda

109 Effect of osmo-ionic concentration on the compound action potential of the cerebro-visceral connective of *Perna perna* (Mollusca, Bivalvia)

113 Comparative physiological responses to stressors in animals

117 Physiological responses of adult *Penaeus semisulcatus* (De Haan) to changes in salinity

121 Decapitation or starvation raise haemolymph ecdysteroid titres in the ovoviparous female cockroach, *Blaberus craniifer* Burm.

129 Effect of dietary lipids on growth and tissue fatty acid composition of grey mullet (*Mugil cephalus*)

137 The effects of chronic exposure to elevated environmental temperature on intestinal morphology and nutrient absorption in the domestic fowl (*Gallus domesticus*)

143 Amino acids and serotonin in *Limax maximus* after a tryptophan devoid diet

151 The essentiality of nectar and arthropods in the diet of the Anna's hummingbird (*Calypte anna*)

157 Relationships between feeding, digestion and water balance in a carnivorous vertebrate, the toad *Bufo bufo* L.

161 Effect of early postnatal long-term fasting on the development of peptide hydrolysis in chicks

167 Effect of gamma-linolenic acid on lipid metabolism in laying hens

171 Lipid and tocopherol composition of farm-raised striped and hybrid striped bass

177 Gastrin metabolism in neonatal pigs and grower-pigs

183 Book Reviews

Vol. 101A, No. 2

187 Recent advances in placental ion transport

195 Selective brain cooling in desert animals: the camel (*Camelus dromedarius*)

203 Na-transport during long-term incubation of the hen lower intestine: no aldosterone effect

209 Ion channels of silkworm moth (*Bombyx mori*) antennae incorporated into planar lipid bilayer

213 Thermogenic, thermolytic and body temperature effects of fenfluramine, a 5-hydroxytryptamine agonist, in the domestic fowl (*Gallus domesticus*)

- G. R. J. Christoffersen 221 The kinetics of homosynaptic short-term depression in cell RPa3 of *Helix pomatia* depends upon the level of activity prior to depression
- Iliana Alcocer, Ximena Santacruz, Herbert Steinbeisser, Karl-Heinz Thierauch and Eugenia M. del Pino 229 Ureotelism as the prevailing mode of nitrogen excretion in larvae of the marsupial frog *Gastrotheca riobambae* (Fowler) (Anura, Hylidae)
- Philippe Sebert, Bernard Simon and Lucien Barthelemy 233 Ethanol concentrations in plasma and tissues of freshwater eel (*Anguilla anguilla*) exposed to 101 ATA of hydrostatic pressure
- L.-Z. Sun and A. Farmanfarmanian 237 Age-dependent effects of growth hormone on striped bass hybrids
- Marion L. Patton and Robert F. Grove 249 The response of statocyst receptors of the lobster, *Homarus americanus*, to movements of statolith hairs
- Marion L. Patton and Robert F. Grove 259 Statolith hair movements and the regulation of tonic gravity reflexes in the lobster, *Homarus americanus*
- Helge Kreützer Johnsen, Karen B. Helle, Jan M. Lundberg, Tomas Hökfelt and Lars P. Folkow 269 Distribution and vasomotor effects of neuropeptides in angular oculi and facial veins of reindeer
- Zenta Kajiura and Okitsugu Yamashita 277 Induction of metamorphosis of the methoprene-induced dauer larvae of the silkworm, *Bombyx mori*, by ecdysteroids
- Päivi Soppela, Raija Sormunen, Seppo Saarela, Pirkko Huttunen and Mauri Nieminen 281 Localization, cellular morphology and respiratory capacity of "brown" adipose tissue in newborn reindeer
- Riku W. Koskela, Jack G. Greenwood and Peter C. Rothlisberg 295 The influence of prostaglandin E<sub>2</sub> and the steroid hormones, 17 $\alpha$ -hydroxyprogesterone and 17 $\beta$ -estradiol on moulting and ovarian development in the tiger prawn, *Penaeus esculentus* Haswell, 1879 (Crustacea: Decapoda)
- K. Ghebremeskel, T. D. Williams, G. Williams, D. A. Gardner and M. A. Crawford 301 Dynamics of plasma nutrients and metabolites in moulting macaroni (*Eudyptes chrysolophus*) and gentoo (*Pygoscelis papua*) penguins
- Vukosava Davidović, Ilijana Vasilev and Vedrana Stojanović-Susulić 309 Dependence of the sympatho-adrenal activity on the nutritional status in corticosterone treated rats
- J. M. Weeks 313 The role of coprophagy in the maintenance of body copper and zinc concentrations in talitrid amphipods (Crustacea, Amphipoda; Talitridae)
- Maria José A. Hebling, Carlos H. S. Pentado and Erasmo G. Mendes 319 Respiratory regulation in workers of the leaf cutting ant *Atta sexdens rubropilosa* Forel, 1908
- Carlos Rosas, Adolfo Sanchez, Elva Escobar, Luis Soto and Andrea Bolongaro-Crevenna 323 Daily variations of oxygen consumption and glucose hemolymph level related to morphophysiological and ecological adaptations of crustacea
- Bernhard Haberl and Wilfried Haas 329 Miracidium of *Schistosoma mansoni*: a macromolecular glycoconjugate as signal for the behaviour after contact with the snail host
- N. W. Pankhurst, R. M. G. Wells and J. F. Carragher 335 Effects of stress on plasma cortisol levels and blood viscosity in blue mao mao, *Scorpius violaceus* (Hutton), a marine teleost
- Bruno Burlando, Giorgio Bavestrello and Attilio Arillo 341 Seasonal changes in the metabolism of the calcareous sponge *Clathrina clathrus* (Schmidt)

Daniel J. Hornbach

Bernard Fried, K. Sundar Rao and Joseph Sherma

Ulrich Sinsch, Rüdiger Seine and Nahed Sherif

J. David Rosenblatt

#### Comparative Nutrition Papers

C. G. Carter, D. F. Houlihan and I. D. McCarthy

Yasuo Mugiya and Keisuke Takayama

W. van Hoven and D. Furstenburg

J. S. Charnock, M. Y. Abeywardena, V. M. Poletti and P. L. McLennan

B. Fauconneau, Anne Basseres and S. J. Kaushik

Orien L. Tulp and Mei Weng

345 The influence of acclimatization, temperature and size on the oxygen consumption of the freshwater clam, *Musculium partumeium* (Say)

351 Fatty acid composition of *Biomphalaria glabrata* (Gastropoda: Planorbidae) fed hen's egg yolk versus leaf lettuce

353 Seasonal changes in the tolerance of osmotic stress in natterjack toads (*Bufo calamita*)

361 A time course study of the isometric contractile properties of rat extensor digitorum longus muscle injected with bupivacaine

369 Feed utilization efficiencies of Atlantic salmon (*Salmo salar* L.) parr: effect of a single supplementary enzyme

375 Calcium excretion into bile in relation to starvation, calcium load and  $17\beta$ -oestradiol administration in the rainbow trout, *Oncorhynchus mykiss*

381 The use of purified condensed tannin as a reference in determining its influence on rumen fermentation

387 Differences in fatty acid composition of various tissues of the marmoset monkey (*Callithrix jacchus*) after different lipid supplemented diets

395 Oxidation of phenylalanine and threonine in response to dietary arginine supply in rainbow trout (*Salmo gairdneri* R.)

403 Effect of genetic dilution on development of diabetes, impaired glucose tolerance and *in vitro* glucose oxidation in LA/N-cp  $\times$  SHR/N-cp F<sub>1</sub> hybrid rats

409 Book Reviews

Vol. 101A, No. 3

#### Mini Review

Anunciación Ilundáin

413 Intracellular pH regulation in intestinal and renal epithelial cells

#### General Papers

David Abel, D. B. Seale and M. E. Boraas

425 Periodicities and transient shifts in anuran (*Xenopus laevis*, *Rana clamitans*) oxygen consumption revealed with flow-through respirometry

D. Čemerikić, V. Nedeljkov, Višnja Galogaža and B. B. Beleslin

433 Effects of acid Ca<sup>2+</sup> Ringer on passive electrical properties and intracellular ion activities in leech Retzius neuron

Jordi Cuadras and Anna Martí

453 Granule containing cells in the crayfish third abdominal ganglion

Noboru Saito, Kiyoshi Shimada, Naoko Nomura, Kosei Oguri, Koji Sato and Masaru Wada

459 Seasonal changes in the reproductive functions of Java sparrows (*Padda oryzivora*)

Bernard Canguilhem, Mireille Masson-Pévet, Paul Pévet and Isabelle Bentz

465 Endogenous, photoperiodic and hormonal control of the body weight rhythm in the female European hamster, *Cricetus cricetus*

R. A. Nunamaker, J. A. Ellis, J. G. Wigginton and N. J. MacLachlan

471 The detection of intracellular bluetongue virus particles within ovine erythrocytes



- Moon K. Song, You Y. Kim, Madalene CY Heng, Nabeel F. Adham and Marvin E. Ament 477 Prostaglandin interacts with steroid sex hormones in the regulation of intestinal zinc transport
- David T. Booth 483 Measurement of water vapor conductance in avian eggs
- R. P. Dales and Y. Kalaç 487 Phagocytic defence by the earthworm *Eisenia foetida* against certain pathogenic bacteria
- Carlos Rosas, Adolfo Sanchez, Luis Soto, Elva Escobar and Andrea Bolongaro-Crevenna 491 Oxygen consumption and metabolic amplitude of decapod crustaceans from the northwest continental shelf of the Gulf of Mexico
- N. J. Adams 497 Embryonic metabolism, energy budgets and cost of production of King *Aptenodytes patagonicus* and Gentoo *Pygoscelis papua* Penguin eggs
- I. Percy Zanders and José M. Rodríguez 505 Effects of temperature and salinity stress on osmoionic regulation in adults and on oxygen consumption in larvae and adults of *Macrobrachium amazonicum* (Decapoda, Palaemonidae)
- N. K. Sanders, S. Morris, J. J. Childress and B. R. McMahon 511 Effects of ammonia, trimethylamine, L-lactate and CO<sub>2</sub> on some decapod crustacean haemocyanins
- Alistair U. Nicol and Peter R. Laming 517 Sustained potential shift responses and their relationship to the ECG response during arousal in the goldfish (*Carassius auratus*)
- Glenn C. Sutter and Robert A. MacArthur 533 Development of thermoregulation in a precocial aquatic bird, the American coot (*Fulica americana*)
- James D. Robertson, Colin B. Cowey and George Leaf 545 The free amino acids in muscle of three marine invertebrates *Nephrops norvegicus* (L.), *Limulus polyphemus* (L.) and *Eledone cirrhosa* (Lamarck)
- A. Ayali and M. P. Pener 549 Density-dependent phase polymorphism affects response to adipokinetic hormone in *Locusta*
- Loredana Stabili, Patrizia Pagliara, Mercedes Metrangolo and Calogero Canicatti 553 Comparative aspects of Echinoidea cytolysins: the cytolytic activity of *Spherechinus granularis* (Echinoidea) coelomic fluid
- K. A. Y. Zainal, A. C. Taylor and R. J. A. Atkinson 557 The effect of temperature and hypoxia on the respiratory physiology of the squat lobsters, *Munida rugosa* and *Munida sarsi* (Anomura, Galatheidae)
- G. P. Gusev, A. O. Sherstobitov and I. A. Skulskii 569 Potassium transport in lamprey (*Lampetra fluviatilis*) erythrocytes: evidence for K<sup>+</sup> channels
- Maria Ines Vera, Francisco Romero, Rodolfo Amthauer, Jaime Figueroa, Oscar Goicoechea, Gloria Leon and Manuel Krauskopf 573 Carp apolipoprotein A-I intestinal absorption and transfer into the systemic circulation during the acclimatization of the carp (*Cyprinus carpio*)
- Sarah Itsaki-Glucklich and Zeev Arad 583 The effect of dehydration on brain temperature regulation in Japanese quail (*Coturnix coturnix japonica*)
- K. J. van Vliet and P. J. Fripp 589 Some chemical and physical properties of the milt of the freshwater teleost, *Barbus kimberleyensis*

#### COMPARATIVE NUTRITION PAPERS

##### Mini Review

- David A. Hood, Roger Kelton and Mary L. Nishio 597 Mitochondrial adaptations to chronic muscle use: effect of iron deficiency

### General Papers

- André Bernard, Claude Caselli,  
Jean-Paul Blond and Hélène Carlier 607 Diet fatty acid composition, age and rat jejunal microvillus enzyme activities
- Masaaki Toyomizu, Kazuko Mehara,  
Tetsuro Kamada and Yuichiro Tomita 613 Effects of various fat sources on growth and hepatic mitochondrial function in mice
- Francisca Pérez-Llamas and  
Salvador Zamora 619 Influence of clenbuterol on the protein digestibility and on nitrogen balance in rats
- Harry Y. C. Wong, Ka-Kui Steve Cheng  
and Thomas E. Nightingale 625 Social stress and atherosclerosis in roosters
- Roselis S. M. Da Silva and  
Luiz Carlos R. Kucharski 631 Effect of hyposmotic stress on the carbohydrate metabolism of crabs maintained on high protein or carbohydrate-rich diet
- Mitsuihiro Furuse, Masaya Kato,  
Sung Ik Yang, Koshi Asakura and  
Junichi Okumura 635 Influence of dietary protein concentrations or of duodenal amino acid infusion on cholecystokinin release in goats

Vol. 101A, No. 4

### Mini Review

- A. De Loof, P. Callaerts and  
J. Vanden Broeck 639 The pivotal role of the plasma membrane-cytoskeletal complex and of epithelium formation in differentiation in animals

### General Papers

- M. A. Partearroyo, S. J. Pilling and  
M. N. Jones 653 The effects of surfactants on the permeability of isolated perfused fish gills to urea
- Agnieszka Lachowicz, Henryk Stępień,  
Jolanta Kunert-Radek and  
Marek Pawlikowski 661 Effects of somatostatin on inositol-1,4,5-trisphosphate content in mouse spleen lymphocytes
- I. N. Oskina and A. A. Tinnikov 665 Interaction between cortisol and cortisol-binding protein in silver foxes (*Vulpes fulvus*)
- C. Y. Hu, A. Suryawan, J. Killefer and  
N. B. Wehr 669 Effect of antiserum to rat adipocytes on growth and body composition of the rat
- John J. Marchalonis, Samuel F. Schluter,  
Han-yi Yang, Valerie S. Hohman,  
Kathy McGee and Lisa Yeaton 675 Antigenic cross-reactions among immunoglobulin of diverse vertebrates (elasmobranchs to man) detected using xenoserum
- Deborah L. MacLatchy, H. Kawauchi  
and J. G. Eales 689 Stimulation of hepatic thyroxine 5'-deiodinase activity in rainbow trout (*Oncorhynchus mykiss*) by Pacific salmon growth hormone
- Polly K. Phillips and James Edward Heath 693 Heat exchange by the pinna of the African elephant (*Loxodonta africana*)
- Janusz Gill 701 Elements of acid-base balance in the European bison, *Bison bonasus* (L.) in the winter period
- John J. Klir and James E. Heath 705 Metabolic rate and evaporative water loss at different ambient temperatures in two species of fox: the red fox (*Vulpes vulpes*) and the arctic fox (*Alopex lagopus*)
- C. Barker Jørgensen 709 Effects of arginine vasotocin, cortisol and adrenergic factors on water balance in the toad *Bufo bufo*: physiology or pharmacology?
- Roger Lennard and Henry Huddart 717 Hypoxia-induced changes in electrophysiological responses and associated calcium movements of flounder (*Platichthys flesus*) heart and gut



- |  |     |   |
|--|-----|---|
| Roger Lennard and Henry Huddart  | 723 | The effects of hypoxic stress on the fine structure of the flounder heart ( <i>Platichthys flesus</i> )   |
| M. P. García, G. Echevarria, F. J. Martínez and S. Zamora                              | 733 | Influence of blood sample collection on the haematocrit value of two teleosts: rainbow trout ( <i>Oncorhynchus mykiss</i> ) and European sea bass ( <i>Dicentrarchus labrax</i> L.) |
| Michio Hidaka  | 737 | Effects of $Ca^{2+}$ on the volume of nematocysts isolated from acontia of the sea anemone <i>Calliactis tricolor</i>   |
| Suping Jiang and Dennis L. Claussen  | 743 | A bioenergetic budget for overwintering newts ( <i>Notophthalmus viridescens</i> ) from southern Ohio: their fat reserves and aerobic metabolic rates in water                      |
| G. Viscor, J. R. Torrella, V. Fouces and J. Palomeque                                  | 751 | Skeletal muscle capillarization and fiber types in urban and homing pigeons ( <i>Columba livia</i> )  |
| Siegfried Wolfram, Christian Hagemann, Beat Grenacher and Erwin Scharrer               | 759 | Characterization of the transport of tri- and dicarboxylates by pig intestinal brush-border membrane vesicles   |
| Izuru Kakuta, Kenji Namba, Kazumasa Uematsu and Siro Murachi                           | 769 | Effects of hypoxia on renal function in carp, <i>Cyprinus carpio</i>  |
| Eberhard Fuchs, Hermann-Josef Gröne, Matthias Simon and Andrea Laue                    | 775 | Distribution of $^{125}I$ -endothelin-1,-2,-3 binding sites in mammalian kidneys  |
| Corine van Erkom Schurink and Charles L. Griffiths                                     | 779 | Physiological energetics of four South African mussel species in relation to body size, ration and temperature  |
| Tadeusz Penczak  | 791 | Contribution to energy transformation by fish populations in a small, tropical river, North Venezuela   |
| D. Burton and M. P. O'Driscoll   | 799 | A comparison of methods of measuring chromatic activity in the integument of a teleost  |
| M. Q. A. Turrin, M. I. Sawaya, M. C. F. Santos, L. V. Veiga, F. Mantero and G. Opocher | 803 | Atrial natriuretic peptide (ANP) increases in the mangrove crab <i>Ucides cordatus</i> when exposed to increased environmental salinity   |
| George Broughton II  | 807 | Hematologic and blood chemistry data for the prairie dog ( <i>Cynomys ludovicianus</i> )  |
| Martin R. Ralph, Sat Bir S. Khalsa and Gene D. Block                                   | 813 | Cyclic nucleotides and circadian rhythm generation in <i>Bulla gouldiana</i>  |
| M. C. Breno and Z. P. Picarelli  | 819 | The vasopressor action of angiotensin in the snake <i>Bothrops jararaca</i>   |
| J. M. Verbavatz, A. Frigeri, R. Gobin, P. Ripoche and J. Bourguet                      | 827 | Effects of salt acclimation on water and urea permeabilities across the frog bladder: relationship with intramembrane particle aggregates   |
| Hugo A. van den Berg   | 835 | Model for mechanics of mollusc systemic heart   |

#### COMPARATIVE NUTRITION PAPERS

- |                                       |     |  |
|---------------------------------------|-----|--|
| A. Bar, E. Vax and S. Striem          | 845 | Relationships between calbindin ( <i>M</i> , 28,000) and calcium transport by the eggshell gland   |
| W. E. Donaldson and V. L. Christensen | 849 | Effects of injections of L-alanine, L-glucose and L-ascorbic acid in newly-hatched turkey poults on glucose metabolism                     |
| Garry M. Wallace and E. W. Pfeiffer   | 853 | The effects of dietary deprivation on body temperature and oxygen consumption in black-tailed prairie dogs ( <i>Cynomys ludovicianus</i> ) |

Ernest H. Avery, Blaine L. Lee,  
Richard A. Freedland and  
Charles E. Cornelius

Yoritaka Aoyama, Hiroshi Sugiura,  
Nobuyuki Amano and Akira Yoshida

Ei Sakaguchi, Kazuaki Nippashi and  
Goro Endoh

Colin G. Scanes

857 Bile pigments in gallbladder and freshly-secreted hepatic duct  
bile from fed and fasted rainbow trout, *Oncorhynchus mykiss*

863 Stimulation of corticosterone secretion by dietary histidine in  
rats

867 Digesta retention and fibre digestion in maras (*Dolichotis*  
*patagonum*) and guinea-pigs

871 Lipolytic and diabetogenic effects of native and biosynthetic  
growth hormone in the chicken: a re-evaluation

